Please insert the attach Sequence Listing (pages 1-5 and renumber the application accordingly.

IN THE CLAIMS:

Please cancel claims 4, 8, 11-14, 21, 23, 29-32, 42-44, and 50-53.

Please amend the following claims:

1. (AMENDED) A method for screening neural system defects in chromosomal material of a mammal, said method comprising:

(A) detecting a modification of a *NAP1L2* gene or a *Nap1l2* gene in the chromosomal material, wherein the modification is selected from a) substitution, b) deletion, c) frame-shift, d) aberrant insertion or e) altered epigenetic control that causes a loss of biological function in the *NAP1L2* gene or the *Nap1l2* gene; and

(B) correlating the modification of the gene with a potential for a neural system defect.

2. (AMENDED) The method of claim 1 wherein the mammal is a human.

3. (AMENDED) The method of claim 1, wherein the modification in the *NAP1L2* gene or the *Nap1l2* gene is detected by hybridization with a labeled probe.

5. (AMENDED) The method of claim 1, wherein the modification is detected by

(A) amplification of the chromosomal material using PCR;

(B) sequencing the chromosomal material to detect the modification of the nucleotide sequence; and

LAW OFFICES
FINNEGAN, HENDERSON,
FARABOW, GARRETT,
& DUNNER, L.L.P.
1300 I STREET, N. W.
WASHINGTON, DC 20005
202-408-4000

(C) correlating the modification of the gene with a potential for neural system defects.

6. (AMENDED) A method for screening neural system defects in human or mouse biological material, said method comprising:

A3 cncld

(A) detecting the absence, inappropriate, or modified expression of a *NAP1L2* gene product or a *Nap1l2* gene product using labeled antibodies to the gene product; and

(B) correlating the absence, inappropriate, or modified expression with a potential for neural system defects.

7. (AMENDED) The method of claim 6, wherein the antibodies are polyclonal or monoclonal.

9. (AMENDED) The method of claim 1, wherein the neural system defect results from at least one of a failure of neural tube closure, incomplete neural tube closure, inappropriate control of nucleosome activity in neurons, inappropriate control of the cell cycle in neurons, inappropriate differentiation of neurons, and inappropriate maintenance of neurons.

A5

15. (AMENDED) A recombinant polynucleotide comprising a nucleotide sequence, wherein said sequence includes at least one modification of a *NAP1L2* gene or a *Nap1l2* gene, wherein the modification is selected from a) substitution, b) deletion, c) frameshift, d) insertion, or e) site-directed mutagenesis that causes a loss of biological function in the *NAP1L2* gene or the *Nap1l2* gene.

LAW OFFICES
FINNEGAN, HENDERSON, FARABOW, GARRETT, & DUNNER, L.L.P.
1300 I STREET, N. W.
WASHINGTON, DC 20005
202-408-4000

A6

17. (AMENDED) The polynucleotide of claim 15, wherein said polynucleotide is a chromosome or a part of a chromosome of a neural cell.

19. (AMENDED) The neural cell of claim 18, wherein the cell is derived from an immortal cell line, neuronal cell line, tumor derived cell line, embryonic stem cell, or wild type animal.

A7

20. (AMENDED) The neural cell of claim 18, wherein the *NAP1L2* gene or the *Nap1l2* gene is under control of a neural-specific promoter, such as nestin, other neuronal members, and inducible promoters.

A8

22. (AMENDED) The neural cell of claim 18, wherein the *NAP1L2* gene or the *Nap1l2* gene is modified, wherein said modification is a) substitution, b) deletion, c) frameshift, d) insertion, e) site-directed mutagenesis or f) naturally occurring mutation that causes a loss of biological function in the *NAP1L2* gene or *Nap1l2* gene.

A9

24. (AMENDED) A polynucleotide comprising the promoter of a *Nap1l2* gene in SEQ ID NO:1, a polynucleotide hybridizing under stringent conditions with SEQ ID NO: 1, at least 20 nucleotides of SEQ ID NO: 1, the promoter of a *NAP1L2* gene in SEQ ID NO: 4, a polynucleotide hybridizing under stringent conditions with SEQ ID NO: 4, at least 20 nucleotides of SEQ ID NO: 4, SEQ ID NO: 6, a polynucleotide hybridizing under stringent conditions with SEQ ID NO:6, or at least 20 nucleotides of SEQ ID NO: 6.

LAW OFFICES
FINNEGAN, HENDERSON,
FARABOW, GARRETT,
& DUNNER, L.L.P.
1300 I STREET, N. W.
WASHINGTON, DC 20005
202-408-4000

(SEQ ID NO. 6)

Genomic sequence *BPX human*

1. acttaaaggaaaaatttatctataaactgacagaatttagaaattaaatacaacaatatgtaaacagttttaatatctgtg
2. atagtaacaaattctttaaatctggaaaataatagtcacttaaaattttaaaaaattgttcaattaataaatgatccaag
3. ttagaaatatgaacaaaataaacctcaccaataattactatacgagaggaaattttaattactgcaaagctttccatccta
4. taaatacattatcaaatagtttaaccatttctttaatgctgagatttagattatttccaattaactcaaaagcatcaagc
5. aaatgttatgatttctaagaataaacataactttccatttggctttgtatatatgtatatttctaacggctgttaaag
6. ccagcattaagaaggagaagcagaaagtcagtattgggactggggttatttataagccaggcaactggttaattgtggtt
7. aattgtctggtatgtttactagtcacgtagttgtatcaccatactagtttttcatcacaggccctcattcgcccccact
8. gccatcggacttcctcctcctcccctcacaggaaatgtttcgagaatttttcaacctaaaatcatatagcttgtgaaaaa
9. taccgacaaacataatatagaatatttaaataactgacacgccacctaaagaccatcagtgctaattcctggtgttttta
10. atctttgaagcgtttgtttatcagctcttccagcatccacctctccccctccccaggtccccgatctaaaatcaaagagat
11. tgatttaggatgggtgggtgccttgtcttctctcattgttcgacattttagttacgttttcttctgagctctctggaaagc
12. ataaaagtataatatctgttaaaagttggatgaatgaactaatgaacgcaatgggattccagaaaactctgcgggagatg
13. ggctagaggacgaggaggaggtggatgaatcagccatgttagagagcctgggaaggtgagcagagttgaaaacttgatag
14. atctaataatttactggctctgggtttgtcagtcactacattgcagcaaatgagattagagcatagttgtgggagggaag
15. gaggtgacgcagcaatctatttgcacctagaaatttttaggcaagtgatagctgcgtaatcatactgcggcaccgtttttt
16. tcttgcagcagtagctgcttgcggaggaggtctgcccactgcagctctctgcagtctccggctctctcctgcaggatcgg
17. tcaacgcagccgtcgccgccctctgcacccagcccaggtcgccactgcttcagtccggttctcaaagcctcagcaccatc
18. ttttatccccgagcagcctggatcgtcgttccctcagtccggacgccactgctaggtccgaccaccgccgcttctgatat
19. ttcggtgagtcttttcctgtggaggtttggtctcccgatctctgtggtagccaccttaggcgtgtacggtcctttgaaaa
20. ATGGCCGAGTCAGAGAACCGCAAGGAGCTGTCGCTGCTGGGCTTGGAGACGATGGGAAGTGCGGTGAAGAAGCTGCCGCTG
21. CGGGGAACATCTGGAGCGCGGTGAAGATGCCGCTGCTGGGCTTGGAGACGATGGGAAGTGCGGTGAAGAAGCTGCCGCTG
22. GGCTTGGGGAAGAAGGGGAAAACGGTGAAGATACTGCTGCTGGGTCCGGGGAAGATGGGAAAAAAGGTGGCGATACTGAT
23. GAGGACTCAGAGGCAGACCGTCCAAAAGGACTTATCGGTTATGTTTTAGATACAGACTTTGTTGAAAGTCTACCTGTGAA
24. AGTTAAGTACCGTGTGTTAGCCCTTAAAAAGCTTCAAACTAGAGCGGCCAATTTAGAATCCAAATTCCTGAGGGAATTTC
25. ATGACATTGAAAGAAAGTTTGCTGAAATGTACCAACCCTTACTGGAAAAAAGACGTCAGATCATCAATGCAATCTATGAA
26. CCTACAGAAGAGGAATGTGAATATAAATCAGACTCTGAGGACTGTGATGATGAGGAAATGTGTCATGAAGAGATGTATGG
27. TAATGAGGAGGGTATGGTACATGAATATGTGGATGAGGACGATGGTTATGAGGACTATTATTATGATTATGCTGTGGAAG
28. AGGAGGAGGAGGAGGAGGAGGAGGACGACATTGAGGCTACTGGAGAAGAGAATAAAGAAGAGGAGGATCCTAAGGGAATT
29. CCTGATTTTTGGCTAACTGTTTTAAAAAACGTTGATACACTCACTCCTTTGATTAAGAAATATGATGAGCCTATTCTGAA
30. GCTCCTGACAGATATTAAAGTTAAGCTTTCAGATCCTGGCGAGCCCCTCAGTTTCACACTAGAATTTCACTTCAAACCCA
31. ATGAATATTTCAAAAATGaGTTGTTGACAAAGACCTATGTGCTGAAGTCAAAGCTAGCATATTATGATCCCCATCCCTAT
32. AGGGGAACTGCGATTGAGTATTCCACAGGCTGTGAGATAGATTGGAATGAAGGAAAGAATGTCACTTTGAAAACCATCAA
33. GAAGAAACAGAAACATCGGATCTGGGGAACAATCCGAACTGTAACTGAAGATTTTCCCAAGGATTCATTTTTCAATTTTT
34. TCTCTCCTCATGGAATCACCTCAAATGGAAGGGATGGAAATGATGATTTTTTACTTGGTCACAATTTACGTACTTACATA
35. ATTCCAAGATCAGTATTATTTTTCTCAGGTGATGCACTGGAATCTCAGCAGGAGGGGGTAGTTAGAGAAGTTAATGATGC
36. AATTTATGACAAAATTATTTATGATAATTGGATGGCTGCAATTGAGGAAGTTAAAGCTTGTTGCAAAAACCTTGAGGCAT
37. TAGTAGAAGACATTGATCGTTAGAGCagagtatacatggccctgaaatteactgccctagatatagttactcaaggtata
38. agaagcttgtgttctgtattttgctttgtagtgttagttaaaacatatgtttcaaaaatataagaaaagttcaaaaact
39. aattaatttgaccttgagttttagtagtagaatgttttcaagaaatgtacactgtggtaaatgatttaaaacactagtat
40. agtgttgtgtagcttaatccttctgaagtctttttgtcatgtagctattaatctgtggctatgaaatgatcagaaatgct
41. aagtgagatcaatatttgtttggaaaaaaaatcttgggaaacaacccaagggttttcgctgttgttgttttttcttttct
42. attttgtttacttagtcctttagctagtggatttaattttgttgtgcctgcttcattttgcaataacaatgcagtagaa
43. tttaaaacttggatgcttaagaggcctgcatatagataagaatttcaggcaaaactacatttattgttaataacagcttg
44. ttcataggctcttgtattttatgtaactgtgataaataatgaaaacttagttatattgaggttattgtttgtcggtgaag
45. tgttagtcacagtattttcaaaagtttgcacatattgttctgtgtaattgtgtaagccataattacagtgtttaattctc
46. ttttcctattacatcattcattgaaagtgatcactttaccattttgaaaagatatttcgtgttctttcactgcaaaataa
47. aaagaataaaaatttcaga

26. (AMENDED) A method of making a recombinant neural cell comprising:

(A) modifying a *NAP1L2* gene or a *Nap1l2* gene or a promoter of the *NAP1L2* gene or a promoter of the *Nap1l2* gene in a neural cell, wherein said modification is selected from a) substitution, b) deletion, c) frame-shift, and d) insertion that causes a loss of biological function in the gene; and

A10

(B) selecting modified cells.

27. (AMENDED) A method of screening for therapeutic compounds comprising:

(A) introducing a compound to be screened to the cell of claim 18; and

(B) correlating a change in the proliferation of the cells with the activity of the compound.

28. (AMENDED) A method of screening for therapeutic compounds comprising:

(A) introducing a compound to be screened to a transgenic knockout animal containing the human *NAP1L2* gene in its chromosomes; and

(B) correlating a change in the development and maturation of the transgenic knockout animal nervous system with the activity of the compound.

33. (AMENDED) A vector containing the nucleic acid molecule of claim 24.

A11 Cm. 1

34. (AMENDED) A recombinant neural cell comprising a vector, wherein the vector comprises the *Nap1l2* gene or the *NAP1L2* gene.

LAW OFFICES
FINNEGAN, HENDERSON,
FARABOW, GARRETT,
& DUNNER, L.L.P.
1300 I STREET, N. W.
WASHINGTON, DC 20005
202-408-4000

35. (AMENDED) The neural cell of claim 34, wherein the *Nap1l2* gene or the *NAP1L2* gene is under the control of a neural-specific promoter, such as nestin or other neuronal genes or inducible promoters.

36. (AMENDED) A recombinant neural cell of claim 35, wherein the *Nap1l2* gene or the *NAP1L2* gene of the native cell is modified, wherein said modification is selected from a) substitution, b) deletion, c) frame-shift, d) insertion, or e) site-directed mutagenesis that causes a loss of biological function in the *Nap1l2* gene or the *NAP1L2* gene.

37. (AMENDED) A method of screening for therapeutic compounds in a cell comprising the nucleotide of claim 24, wherein the method comprises:

(A) introducing to the cell a compound to be screened; and

(B) correlating a change in the proliferation of the cell with activity of the compound.

39. (AMENDED) A method of increasing the expression of *NAP1L2* gene in tumoral human neural cells or for decreasing the expression of *NAP1L2* gene in human neural cells afflicted by a degenerating disease, comprising administering the therapeutic compounds of claim 27 to achieve an increase in expression of *NAP1L2* gene in tumoral human neural cells or a decrease in expression of *NAP1L2* gene in human neural cells afflicted by a degenerating disease.

41. (AMENDED) The plasmid deposited at C.N.C.M. under the Accession Number I-2463, I-2464, I-2465, or I-2466.

45. (AMENDED) A polynucleotide comprising the sequence SEQ ID NO: 6.

LAW OFFICES
FINNEGAN, HENDERSON, FARABOW, GARRETT, & DUNNER, L.L.P.
1300 I STREET, N.W.
WASHINGTON, DC 20005
202-408-4000

A14 cncld

46. (AMENDED) The polynucleotide of claim 24, wherein said polynucleotide further comprises a heterologous amino acid sequence coding for a heterologous polypeptide under the control of the *NAP1L2* promoter or the *Nap1l2* promoter.

Please add the following new claims:

54. (NEW) The method of claim 1, wherein the mammal is a mouse.

55. (NEW) The method of claim 6, wherein the neural system defect results from at least one of a failure of neural tube closure, incomplete neural tube closure, inappropriate control of nucleosome activity in neurons, inappropriate control of the cell cycle in neurons, inappropriate differentiation of neurons, and inappropriate maintenance of neurons.

A15 Cncl

56. (NEW) The polynucleotide of claim 16, wherein said polynucleotide is a chromosome or a part of a chromosome of a neural cell.

57. (NEW) A neural cell comprising the polynucleotide of claim 56.

58. (NEW) The neural cell of claim 57, wherein the cell is derived from an immortal cell line, neuronal cell line, tumor derived cell line, embryonic stem cell, or wild type animal.

59. (NEW) The neural cell of claim 57, wherein the *NAP1L2* gene or the *Nap1l2* gene is under control of a neural-specific promoter, such as nestin, other neuronal members, and inducible promoters.

60. (NEW) The neural cell of claim 57, wherein the *NAPIL2* gene or the *Nap1l2* gene is modified, wherein said modification is a) substitution, b) deletion, c) frameshift,

LAW OFFICES
FINNEGAN, HENDERSON,
FARABOW, GARRETT,
& DUNNER, L.L.P.
1300 I STREET, N. W.
WASHINGTON, DC 20005
202-408-4000